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1968

FOREST PEST CONDITIONS IN THE PACIFIC NORTHWEST

INSECT AND DISEASE CONTROL BRANCH
DIVISION OF TIMBER MANAGEMENT
PACIFIC NORTHWEST REGION
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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This is the 21st annual report of forest pest conditions in Oregon and Washington based on cooperative surveys sponsored by the Northwest Forest Pest Action Council. The combined efforts of many organizations and individuals made these surveys possible. Special acknowledgement is made to the principal cooperators: Oregon State Board of Forestry and Washington Department of Natural Resources.

COVER BACKGROUND: Douglas-fir killed by the Douglas-fir beetle, *Dendroctonus pseudotsugae* Hopk.

FOREST PEST CONDITIONS IN THE PACIFIC NORTHWEST

DURING 1968

BY

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AND

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FEBRUARY 1969

INSECT AND DISEASE CONTROL BRANCH
DIVISION OF TIMBER MANAGEMENT
PACIFIC NORTHWEST REGION
U. S. FOREST SERVICE

INTRODUCTION

This report is a continuation of the series begun in 1947. Many of the statistical tables formerly included have been eliminated to make it more readable. More detailed statistical information on any particular pest is available upon request.

Epidemic outbreaks of forest insects were detected and mapped by aerial survey during June, July, and August. Ground surveys were made to verify the aerial survey findings, detect subepidemic insect populations, and evaluate the threat and determine insect population trends. These surveys were coordinated by the U. S. Forest Service in cooperation with Oregon State Department of Forestry and Washington State Department of Natural Resources. Larch casebearer surveys in early June in northeastern Washington were coordinated with Region 1, U. S. Forest Service, Missoula, Montana. Flying time for all aerial detection surveys totaled 223 hours.

Included in this report are tree losses attributed to causes other than insects, such as dying hemlock, bear damage to poles and saplings, and some diseases.

For ease in summarizing forest insect survey data, both States are divided into forest insect reporting areas as shown on the map on the inside back cover. These insect reporting areas are a simple convenience for reporting conditions in a geographical area. No attempt has been made to summarize insect outbreaks according to land ownership within an individual area.

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CONDITIONS IN BRIEF

Forest insect outbreaks were reported on 2,976,880 acres of forest land in Oregon and Washington in 1968 (table 1). Bark beetles were the most serious, while defoliators were the most widespread. This infested acreage was the most extensive recorded in the past ten years, as shown in the following table of insect damage in Oregon and Washington:

Year	Infested acreage	Year	Infested acreage
1959	1,448,360	1964	1,116,130
1960	1,272,960	1965	1,402,610
1961	1,223,230	1966	1,220,710
1962	1,305,170	1967	1,910,900
1963	1,311,080	1968	2,976,880

Highlights of both aerial and ground surveys in 1968 are:

1. Douglas-fir beetle.--Severe tree mortality occurred in westside forests of both Oregon and Washington. Losses in eastside forests were generally lower than last year.

2. Douglas-fir engraver.--Damage was common in western Oregon.

3. Engelmann spruce beetle.--Tree killing remained low in both Oregon and Washington.

4. Fir engraver.--Outbreaks increased in eastern Oregon and Washington.

5. Mountain pine beetle.--Outbreaks increased sharply in lodgepole pine and only moderately in ponderosa pine. Losses in sugar and western white pine were lower this year.

6. Oregon pine ips.--Top killing in mature trees and killing of young trees increased over both States.

7. Western pine beetle.--Losses increased in all mature ponderosa pine stands.

8. Silver fir beetles.--Tree killing was at a low level in Washington. No infestations occurred in Oregon.

9. Western hemlock looper.--Outbreaks spread on the Mt. Baker National Forest in northwest Washington.

10. Pine needle miner.--The widespread outbreaks on lodgepole and ponderosa pine in central Oregon increased in extent.

11. Larch casebearer.--The westward spread of the infestation continued in northeast Washington.

12. European pine shoot moth.--No new infestations were detected in 1968.

13. Balsam woolly aphid.--Widespread tree killing occurred in subalpine fir in both Oregon and Washington.

TABLE 1

Table 1.--Summary of forest insect infestations in Oregon and Washington during 1967 and 1968

Insects[1/]	Oregon		Washington		Regional total	
	1967	1968	1967	1968	1967	1968
	Acres	Acres	Acres	Acres	Acres	Acres
Bark beetles:						
Douglas-fir beetle (Westside)	47,710	200,790	15,960	37,950	63,670	238,740
Douglas-fir beetle (Eastside)	2,480	4,570	37,450	12,460	39,930	17,030
Douglas-fir engraver	220	5,140	0	0	220	5,140
Engelmann spruce beetle	3,170	5,570	4,650	980	7,820	6,550
Fir engraver	25,470	287,940	3,580	27,920	29,050	315,860
Mountain pine beetle (L)	186,690	203,980	2,530	6,240	189,220	210,220
Mountain pine beetle (S)	1,000	570	0	0	1,000	570
Mountain pine beetle (W)	90,040	78,890	74,280	43,650	164,320	122,540
Mountain pine beetle (P)	43,090	50,820	18,290	22,970	61,380	73,790
Oregon pine ips	55,170	68,750	900	3,590	56,070	72,340
Western pine beetle	65,870	174,160	6,730	33,810	72,600	207,970
Silver fir beetles	0	0	7,050	5,330	7,050	5,330
All bark beetles	520,910	1,081,180	171,420	194,900	692,330	1,276,080
Defoliators:						
Sawflies on western hemlock	500	0	0	0	500	0
Larch budmoth	0	0	139,060	4,060	139,060	4,060
Sawflies on true firs	4,400	750	0	0	4,400	750
Sawflies on larch	680	7,010	15,660	3,240	16,340	10,250
Sawflies on knobcone pine	6,020	0	0	0	6,020	0
Western hemlock looper	0	0	1,600	3,160	1,600	3,160
Needle miners (L)	80,460	114,280	0	0	80,460	114,280
Needle miners (P)	4,800	5,920	0	0	4,800	5,920
Larch casebearer	0	0	783,650	1,392,620	783,650	1,392,620
Forest tent caterpillar on red alder	10,990	0	0	0	10,990	0
All defoliators	107,850	127,960	939,970	1,403,080	1,047,820	1,531,040
Sucking insects:						
Balsam woolly aphid	116,080	138,830	41,470	30,930	157,550	169,760
Spider mites	13,200	0	0	0	13,200	0
All sucking insects	129,280	138,830	41,470	30,930	170,750	169,760
All insects	758,040	1,347,970	1,152,860	1,628,910	1,910,900	2,976,880

[1/] Mountain pine beetle and needle miner infestations are separated by tree species: L, lodgepole pine; S, sugar pine; W, western white pine; P, ponderosa pine.

MAJOR DEFOLIATOR PROBLEMS

The trend in defoliators was mixed. The activity of sawflies, budworms, and tent caterpillars was downward, while that of the larch casebearer, western hemlock looper and needle miners on pines was upward.

LARCH CASEBEARER, *Coleophora laricella* (Hübner)

Severe defoliation of western larch continued throughout northeastern Washington. Since its first discovery near Spokane in 1960, the moth has continued to spread westward. This year 1,392,620 acres of defoliated timber was mapped by the aerial survey (table 2). Subepidemic populations are now present as far west as the Okanogan National Forest in north central Washington. Tree growth has been reduced by larval feeding in older areas, but no tree killing has resulted.

Subepidemic populations were found for the second year on the Umatilla National Forest in southeast Washington. The larch casebearer has yet to be found in Oregon.

Release of the parasite, *Agathis pumila* (Ratz.) continues. This year, parasites were released at five additional sites, bringing the total release sites for the past 3 years to 25.

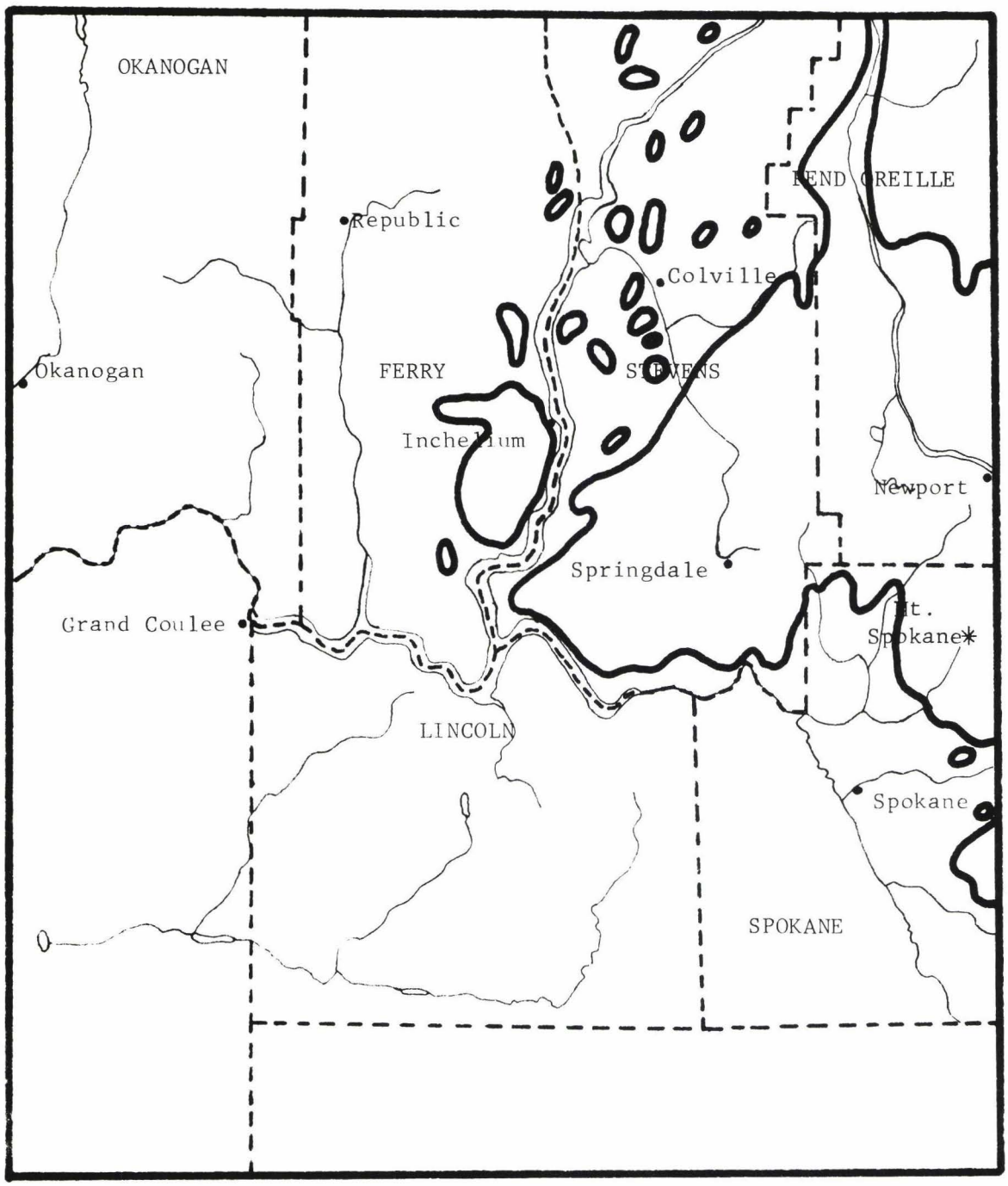


Figure 1. Defoliation by the larch casebearer in northeast Washington during 1968

All intensities of defoliation are present in the outlined areas. Larch casebearer populations at lower levels occur over a much wider area.

Table 2.--Trend of larch casebearer infestations in Washington, 1964-1968

(In acres)

Reporting area 1/	Year				
	1964	1965	1966	1967	1968
Kaniksu N.F.	30,180	167,480	244,140	350,560	469,160
Northeast Washington Dist.	82,530	151,160	137,500	182,730	263,440
Colville N.F.	200	17,180	63,840	193,500	474,940
Colville I.R.	0	1,120	2,600	13,760	92,600
Spokane I.R.	0	3,440	22,600	53,100	92,480
All areas	112,910	340,380	470,680	783,650	1,392,620

1/ N.F., National Forest; I.R., Indian Reservation

LARCH SAWFLY, *Pristiphora erichsonii* (Htg.)

This insect caused light to heavy defoliation of western larch at widely scattered locations in both States. In Oregon, occurrence was limited to the Mt. Hood National Forest and the Warm Springs Reservation. Defoliation in Washington occurred in small patches on the Colville and Kaniksu National Forests in the northeast corner of the State and on the Yakima Indian Reservation in south central Washington. The parasite-predator complex associated with this insect is expected to hold populations at a low level.

LARCH BUDMOTH, *Zieraphera griseana* (Hübner)

The extensive outbreaks of 1967 subsided. New infestations developed in other areas where light defoliation occurred at small, widely scattered spots on the Wenatchee and Snoqualmie National Forests in Washington. Defoliation by this insect is not expected to become serious in 1969.

EUROPEAN PINE SHOOT MOTH, *Rhyacionia buoliana* (Schiff.)

Extensive surveys in many cities, small communities, and nurseries throughout Oregon and Washington failed to turn up any new infestations in 1968 outside the known zone of infestation. Known infestations now occur in many cities of western Washington as well as the Pasco-Kennewick-Walla Walla area in southeast Washington. In Oregon, the only known infestations occur at Hermiston and McNary Dam.

WESTERN HEMLOCK LOOPER, *Lambdina fiscellaria lugubrosa* Hulst.

Heavy defoliation of western hemlock in the Bacon Creek drainage on the Mt. Baker National Forest in Washington continued. New areas of heavy defoliation occurred in the Cascade River drainage. Subepidemic populations were found elsewhere at widely scattered points on the Mt. Baker National Forest.

A pilot field test was made on 500 acres of lightly infested, old-growth hemlock in Sonny Boy Creek on the Mt. Baker National Forest this year. Zectran was applied by a helicopter equipped with the bi-fluid aerosol spray delivery system at the rate of 13 ounces per acre. Results were not encouraging. A five-day mortality check showed the test reduced the population by about 20 percent.

NEEDLE MINER, *Coleotechnites* near *milleri*

This small moth caused severe defoliation of lodgepole and ponderosa pine on the Deschutes and Winema National Forests in central Oregon. The outbreak has expanded this year, but egg surveys indicate that populations should decline next year. Tree growth has been reduced, but no significant tree mortality has yet occurred.

SPRUCE BUDWORM, *Choristoneura fumiferana* (Clem.)

Very light budworm feeding was detected by ground survey on Simcoe Ridge in south central Washington and on Mission Ridge on the Wenatchee National Forest in Washington. Fall egg surveys on Simcoe Ridge indicate no population buildup for next year.

MAJOR BARK BEETLE PROBLEMS

Most bark beetle populations had an upward trend. Douglas-fir beetle activity was the highest recorded in recent years. The prolonged drought and high temperatures during the summer of 1967 contributed to these population increases.

DOUGLAS-FIR BEETLE, *Dendroctonus pseudotsugae* Hopk.

This beetle killed about one billion board feet of Douglas-fir timber on 255,770 acres in Oregon and Washington. The heaviest and most extensive tree mortality was on the west side of the Cascade Mountains.

Areas of concentrated tree killing in westside forests were in the Baker River drainage of the Mt. Baker National Forest and in the Wind River and Little White Salmon River drainages of the Gifford Pinchot National Forest in Washington. In Oregon, heavy losses occurred in the Clackamas River drainage of the Mt. Hood National Forest and on the Rogue and Umpqua River drainages in southwest Oregon.

The most severe damage in eastside forests occurred on the Wallowa-Whitman National Forest in Oregon and on the Colville Indian Reservation, and Colville and Okanogan National Forests in Washington.

The present outbreak on westside forests developed soon after the floods in December 1964. Many of the flood-damaged trees were attacked by the beetles in the spring and summer of 1965. Winter winds in 1965-1966 caused a more than normal amount of blowdown and wind-damaged trees. The damaged timber and some surrounding trees were attacked in 1966. Drought conditions coupled with very high beetle populations in 1967 resulted in extensive tree killing in 1968.

Less tree mortality is expected on the Mt. Hood, Umpqua, and Siskiyou National Forests in Oregon next year. Outbreaks on the Gifford Pinchot National Forest in Washington and on the Rogue River National Forest in Oregon will continue at about the same level next year.

Even though the trend appears to be downward on some forests, a substantial additional volume of beetle kill is expected to show up in 1969. Unless some additional stand disturbance occurs during the next 12 months, tree killing is predicted to taper off sharply in 1970.

Douglas-fir beetle
egg galleries

Douglas-fir beetle infested trees yarded and
decked during salvaging operations

Salvaging Douglas-fir killed by the Douglas-fir beetle

Table 3.--Trend of Douglas-fir beetle infestations in westside Douglas-fir in Oregon and Washington, 1964-1968

(In acres)

Reporting area 1/	Year				
	1964	1965	1966	1967	1968
Oregon:					
Mt. Hood N.F.	450	400	760	580	50,520
Rogue River N.F.	240	2,580	2,240	9,420	29,080
Siskiyou N.F.	6,760	15,200	2,460	16,160	39,310
Siuslaw N.F.	17,890	54,080	9,360	4,600	5,260
Umpqua N.F.	2,360	30,260	1,820	5,960	48,910
Willamette N.F.	720	17,850	9,310	3,070	5,760
Coos-Douglas District	19,630	69,720	19,310	7,700	16,920
Northwest Oregon District	0	1,400	20	220	5,030
Oregon areas	48,050	191,490	45,280	47,710	200,790
Washington:					
Gifford Pinchot N.F.	460	2,930	2,980	13,240	26,160
Mt. Baker N.F.	0	160	200	2,220	7,560
Olympic N.F.	0	440	80	0	430
Snoqualmie N.F.	230	2,260	680	0	2,080
Puget Sound Dist.	0	440	0	0	0
Northwest Washington District	0	40	0	0	0
Southwest Washington District	0	3,680	1,280	240	60
Olympic N.P.	80	80	0	260	480
Washington areas	770	10,030	5,220	15,960	36,830
Regional total	48,820	201,520	50,500	63,670	237,620

1/ N.F., National Forest; N.P., National Park

Table 4.--Trend of Douglas-fir beetle infestations in eastside Douglas-fir in Oregon and Washington, 1964-1968

(In acres)

Reporting area 1/	Year				
	1964	1965	1966	1967	1968
Oregon:					
Malheur N.F.	810	6,160	1,250	0	0
Ochoco N.F.	470	550	110	0	0
Umatilla N.F.	10,640	1,900	420	100	180
Wallowa-Whitman N.F.	52,220	20,710	1,910	2,280	4,020
Umatilla I.R.	0	0	70	0	0
Warm Springs I.R.	0	50	0	0	240
Central Oregon District	0	0	210	10	0
Lookout Mt. Dist.	0	0	620	10	130
Oregon areas	64,140	29,370	4,590	2,400	4,570
Washington:					
Colville N.F.	4,630	8,780	4,860	16,170	6,000
Kaniksu N.F.	360	180	80	300	0
Okanogan N.F.	6,830	12,160	10,400	11,500	2,060
Umatilla N.F.	2,710	0	0	50	180
Wenatchee N.F.	760	1,120	200	640	440
Colville I.R.	2,050	2,300	4,440	7,940	3,520
Spokane I.R.	0	0	160	0	0
Yakima I.R.	0	0	0	0	260
Glenwood Dist.	0	280	2,160	820	1,120
Northeast Washington Dist.	0	120	0	0	0
Washington areas	17,340	24,940	22,300	37,450	13,580
Regional total	81,480	54,310	26,890	39,850	18,150

1/ N.F., National Forest; I.R., Indian Reservation

MOUNTAIN PINE BEETLE, *Dendroctonus ponderosae* Hopk.

Losses in the lodgepole pine stands of eastern and central Oregon increased sharply over the past year. Most of the tree killing occurred on the Deschutes, Fremont, Umatilla, Wallowa-Whitman, and Winema National Forests. Beetle activity in Washington increased, particularly on the Colville National Forest.

Tree killing in stagnated, pole-size ponderosa pine stands increased slightly. In Oregon, most of the tree mortality occurred on Dooley Mountain on the Wallowa-Whitman National Forest. Outbreaks were also located on the Fremont, Deschutes, Malheur, and Mt. Hood National Forests. Most of the infestations in Washington occurred on the Colville, Okanogan, and Wenatchee National Forests and on the Colville and Yakima Indian Reservations.

Infestations in western white pine stands decreased. Most outbreaks occurred near the crest of the Cascade Mountains in Oregon and Washington.

Mountain pine beetle activity in the sugar pine stands in southwest Oregon was substantially reduced from last year.

WESTERN PINE BEETLE, *Dendroctonus brevicomis* LeC.

Outbreaks in mature ponderosa pine increased in both Oregon and Washington. Most tree killing in Oregon occurred on the Deschutes, Fremont, Malheur, and Ochoco National Forests and the Warm Springs Indian Reservation. In Washington, losses were centered in the Klickitat River drainage of south central Washington. The hot, dry summer of 1967 probably added substantially to this population buildup. Populations are expected to remain static or slightly downward in 1969.

ENGELMANN SPRUCE BEETLE, *Dendroctonus obesus* (Mann.)

Killing of Engelmann spruce remained low in both Oregon and Washington. Small outbreaks occurred on the Umatilla and Wallowa-Whitman National Forests in Oregon and on the Colville and Kaniksu National Forests in Washington. No upswing in tree killing is expected in 1969.

SILVER FIR BEETLES, *Pseudohylesinus* spp.

Activities of these beetles were relatively low in the Northwest in 1968. Small patches of true fir killing were most common on the Mt. Baker and Olympic National Forests in Washington. No tree killing occurred in Oregon. No major epidemics are expected in 1969. Salvage of beetle-infested trees, where economically possible, is the only control planned.

OREGON PINE IPS, *Ips pini* Say.

Tree killing by this bark beetle increased in young ponderosa pine stands in both Oregon and Washington. The most severe centers of beetle activity occurred on the Malheur and Wallowa-Whitman National Forests in Oregon. In Washington, tree killing was concentrated on the Umatilla National Forest and Glenwood District of the Washington State Department of Natural Resources. The severe drought and high temperatures during the summer of 1967 were probably contributing factors in this population buildup. Populations are expected to remain static or decrease slightly in 1969.

FIR ENGRAVER, *Scolytus ventralis* LeC.

Outbreaks of this bark beetle caused the most severe killing of true fir in Oregon and Washington in recent years. Aerial surveys revealed heavy losses on the Malheur, Rogue River, Umatilla and Wallowa-Whitman National Forests in Oregon. Heaviest losses in Washington occurred on the Colville and Umatilla National Forests.

DOUGLAS-FIR ENGRAVER

Increased top-killing of Douglas-fir occurred throughout the Willamette Valley and southwest Oregon. It was particularly severe in drought-weakened stands. The condition is not expected to become severe.

MAJOR SUCKING INSECT PROBLEMS

BALSAM WOOLLY APHID

Tree killing in true firs was generally greater in Oregon and Washington. Damage, particularly in subalpine fir, is now common along the crest of the Cascade Mountains from the Skykomish River in Washington southward to Crater Lake National Park in Oregon. Salvage of infested, merchantable trees and those of declining thrift is being done where economically feasible.

MINOR FOREST INSECT PROBLEMS

SAWFLIES, *Neodiprion* spp.

The hemlock sawfly, *Neodiprion tsugae* Midd. caused some light defoliation on the Mt. Hood National Forest in Oregon and on the Mt. Baker National Forest in Washington. An undetermined species of *Neodiprion* caused moderate defoliation of true firs on 750 acres on the Winema National Forest, Oregon.

A TENT CATERPILLAR, *Malacosoma* sp.

Larval feeding caused light to very heavy defoliation of red alder in the coastal valleys of Oregon. Disease is expected to reduce the populations and less damage is predicted for next year.

ALDER FLEA BEETLE, *Altica ambiens* LeC.

Moderate defoliation of red alder along the Oregon Coast and southern Washington Coast resulted from the feeding of this beetle.

PINE NEEDLE-SHEATH MINER, *Zelleria haimbachi* Busck.

Larvae of this small moth caused light defoliation of lodgepole pine in and around Olympia, Washington.

SILVER SPOTTED HALISIDOTA, *Halisidota argentata* Pack.

This insect caused light defoliation of ornamental spruces and Douglas-fir along the northern coast of Oregon.

OTHER FOREST PEST PROBLEMS

DYING HEMLOCK

Several thousands of acres of mature and over-mature western hemlock died from unknown causes. The area of distressed timber occupied 85,910 acres, compared with 44,710 in 1967. All the tree mortality occurred in Washington with almost 75 percent on the Mt. Baker National Forest, 20 percent on the Olympic Peninsula, and the remaining 5 percent in southwest Washington.

TREE DAMAGE BY BEARS

Bears continued to damage young Douglas-fir and western hemlock in already understocked stands. Regionwide, 1968 tree mortality was less than the 1967 total. Although most of the damage in the Region occurred in Washington, losses in this State decreased, whereas, tree killing in Oregon increased. Majority of the damage in Washington was located in the southwest corner on the Southwest Washington District and the Olympic Peninsula. The most serious losses in Oregon were found in the Northwest Oregon District. Significant bear activity occurred on the Willamette and Siuslaw National Forests.

RHABDOCLINE NEEDLE CAST

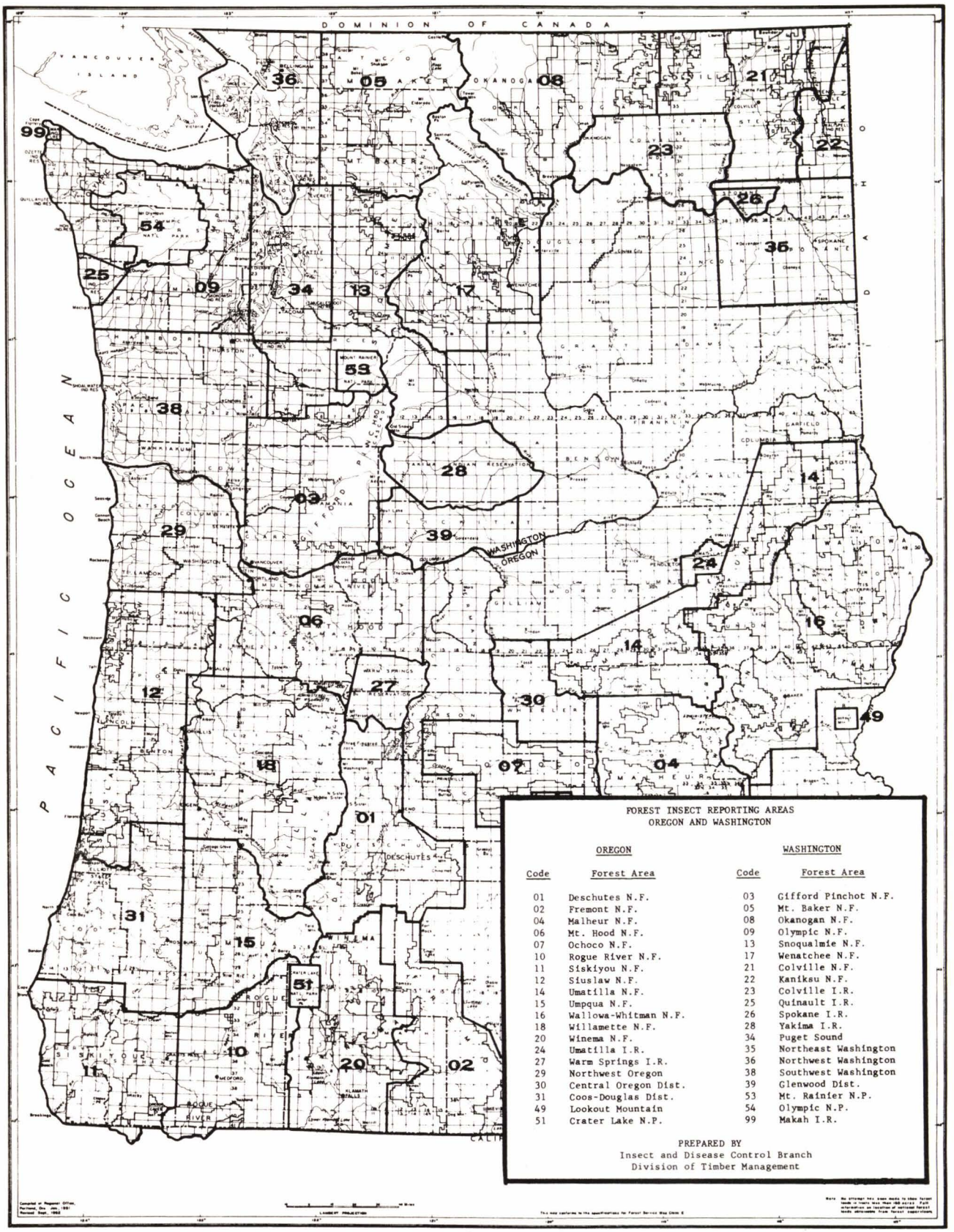
A needle cast disease, *Rhabdocline pseudotsugae*, caused moderate to heavy needle killing on the Siuslaw National Forest near Mt. Hebo and on the Blodgett Tract. The fungus is associated primarily with second-growth Douglas-fir and causes damage through excessive needle casting. Repeated infection reduces growth and vigor and, in severe cases, death of affected trees. Weakened trees may become infested by other opportunistic pests. Sanitation thinning is recommended wherever possible in affected stands.

ARMILLARIA ROOT ROT

The root rot, *Armillaria mellea*, was found associated with several bark beetle infestations. The most notable incidences were on the Deschutes National Forest in the vicinity of Cache Mountain and Odell Lake. Drought is believed to be the cause of most outbreaks since dry summers often precipitate Armillaria root rot activity.

NEEDLE CAST DISEASE OF PINES

An as yet unidentified needle disease has been found on ponderosa pine in southwest Oregon. Several plantations on the Tiller Ranger District, Umpqua National Forest, and on the Rigdon Ranger District, Willamette National Forest, are severely infected. The damage potential of this disease is unknown. Other pines may also be susceptible.



FOREST INSECT REPORTING AREAS
OREGON AND WASHINGTON

OREGON		WASHINGTON	
Code	Forest Area	Code	Forest Area
01	Deschutes N.F.	03	Gifford Pinchot N.F.
02	Fremont N.F.	05	Mt. Baker N.F.
04	Malheur N.F.	08	Okanogan N.F.
06	Mt. Hood N.F.	09	Olympic N.F.
07	Ochoco N.F.	13	Snoqualmie N.F.
10	Rogue River N.F.	17	Wenatchee N.F.
11	Siskiyou N.F.	21	Colville N.F.
12	Siuslaw N.F.	22	Kaniksu N.F.
14	Umatilla N.F.	23	Colville I.R.
15	Umpqua N.F.	25	Quinault I.R.
16	Wallowa-Whitman N.F.	26	Spokane I.R.
18	Willamette N.F.	28	Yakima I.R.
20	Winema N.F.	34	Puget Sound
24	Umatilla I.R.	35	Northeast Washington
27	Warm Springs I.R.	36	Northwest Washington
29	Northwest Oregon	38	Southwest Washington
30	Central Oregon Dist.	39	Glenwood Dist.
31	Coos-Douglas Dist.	53	Mt. Rainier N.P.
49	Lookout Mountain	54	Olympic N.P.
51	Crater Lake N.P.	99	Makah I.R.

PREPARED BY
Insect and Disease Control Branch
Division of Timber Management

GPO 995-404